

16-port Flexible Switch Installation Guide

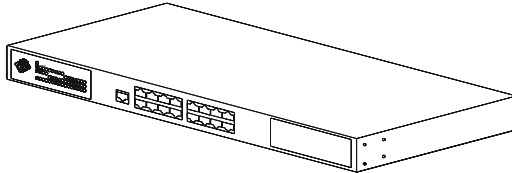
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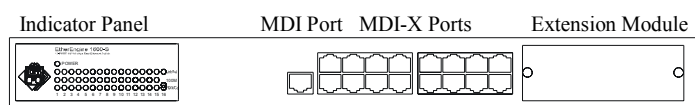
Installation Guide

16-port 10/100Mbps Nway Ethernet Switching HUB

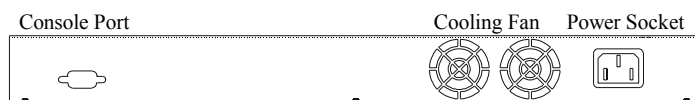
Sixteen 10/100Mbps RJ45 TX ports + one extension module port / with port-base configuration and VLAN, Trunking functions.



Front View:

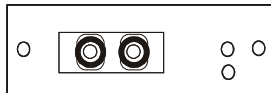


Rear View:



The Extension Modules:

1*100BaseFX SC/ST



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1. Introduction

This 16-port Switching Hub is flexible 10/100Mbps Fast Ethernet switching HUB. One extension module port is designed for 100Base-Fx extension. This module can be 1*SC/ST ports or module and the switch will become a 17 ports switching hub. This flexibility is helpful for users to extend their network connection.

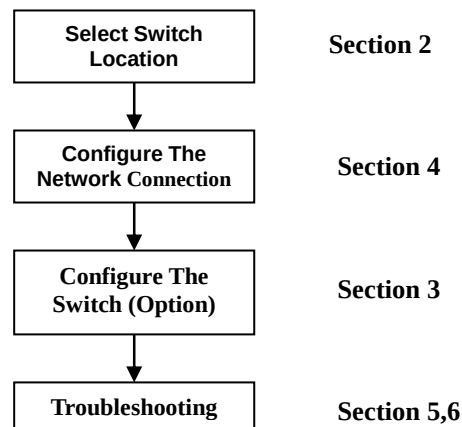
There is a console port at the rear panel of the 16-port switching hub. User can setup per-port 10/100Mbps, Half/Full duplex configuration from the console port. The VLAN and Trunking functions of the 16-port switching hub is also setup from the console port. Users can setup VLAN groups for network management or user can setup trunking connection for switch-to-switch connection with faster bandwidth. This switching HUB can auto-sense the operation speed (10Mbps or 100Mbps) and operation mode (full or half duplex)*. There is a clear indicator panel for Link/Act, 100M speed and Full-duplex/Collision of each port for network status monitor.

*Notes: If 100BaseFX SC/ST connectors, the operation speed is 100Mbps and the operation mode is full duplex.
And the operation mode can be changed to half duplex from the console port.

1.1 Package Contents

- One 16-port 10/100Mbps Ethernet Switching Hub
- One AC power Cord
- Two rack-mount kits and screws
- Four self-adhesive rubber foot pads
- This installation guide

1.2 Installation Procedure



2. Where To Place the Switch

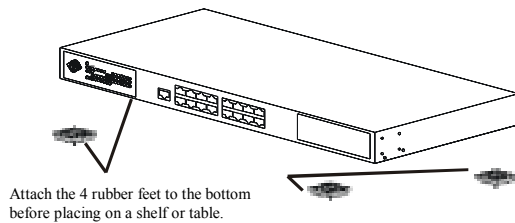
This 16-port Switch can be placed on a flat surface (your desk, shelf or table) or mounted onto a rack.

Place the 16-port Switch at a location with these connection considerations in mind:

- The switch configuration does not break the rules as specified in section 4.
- The switch is accessible and cables can be connected easily to it.
- The cables connected to the switch are away from sources of electrical interference such as radio, computer monitor, and light fixtures.
- There is sufficient space surrounding the hub to allow for proper ventilation (the hub may not function according to specifications beyond the temperature range of 0 to 40 degrees C).

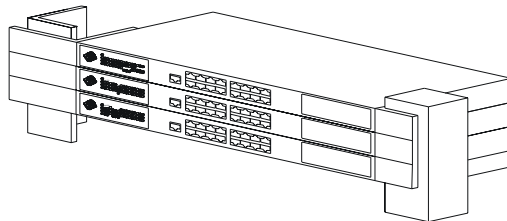
2.1 Placing The Switch on a Desk or Shelf

- Stick the self-adhesive rubber foot pads (that come with this package) on each of the 4 concave spaces located on the bottom of the first hub.
- Place the first hub on a firm flat surface where you want to install the stack.
- Repeat step a. for each hub before stacking them. The rubber foot pads cushion the hub against shock or vibrations and provide space between each hub for ventilation.



2.2 Mounting The Switch Onto a Rack

1. Use the brackets and screws supplied in the rack mounting kit.
2. Use a cross-head screwdriver to attach the brackets to the side of the hub.
3. Position the switch in the rack by lining up the holes in the brackets with the appropriate holes on rack, and then use the supplied screws to mount the hub onto the standard EIA 19-inch rack.



3. Configure the Switch

3.1 Configure the Switch from the Console Port

[1] Setup Hardware and Software for configuration

[Hardware setup]

Connect from the console port (at rear panel) of the Switch to COM port of PC with the RJ45-DB9 adapters and one network cable, or standard RS232 cable.

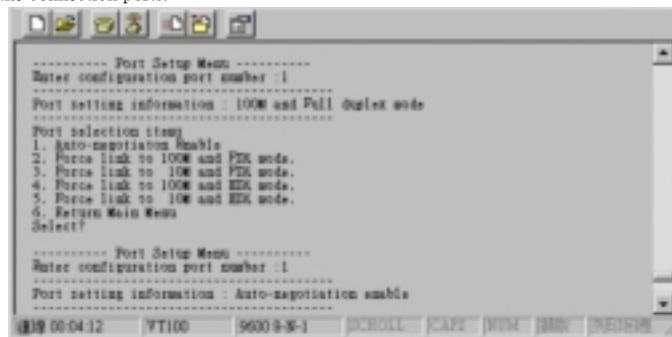
[Software setup]

1. PC is running Win95/98/NT.
2. Start ->Program ->Accessory ->Terminal. Execute "Hypertrm" program.
3. If the connection file has been created, cancel the new connection request and open the connection file. If the connection file has not been created, create a new connection named "SW16F" ->Select COM port of PC ->Set COM port parameters as "Baud Rate: 9600, Data Bits: 8, parity Check: None, Stop Bit: /, Flow Control: None" Then OK.
4. Power on the Switch and the setup console will appear as follow:



[2] Configure Connection Ports of the Switch

1. Users can enable/disable the auto-negotiation function of the connection ports with this function. If the auto-negotiation is disabled, users can set the connection speed, full/half duplex of the connection ports. The default setting is auto-negotiation enable.
2. Follow the direction in the setup menu to setup the configuration of the connection ports.

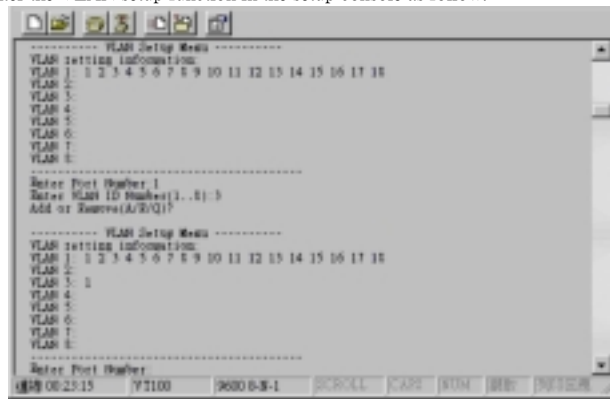


3. The indicators of the display panel of the Switch may ON/OFF depending on the setting of the ports in this function when the cables are link connected.

Notes: If the connection ports are 100Base-FX SC/ST ports, the auto-negotiation function of the ports will be always disable. User can set the 100Base-FX ports to full/half duplex and enable/disable flow-control in this function.

[3] Setup VLAN Groups of the Switch

1. Enter the VLAN setup function in the setup console as follow.

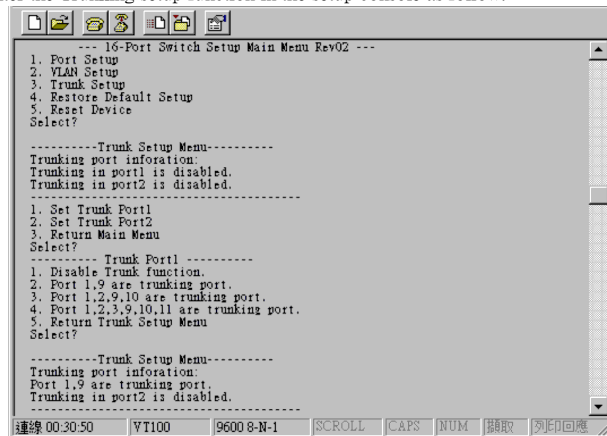


2. All of the connection ports are in the same VLAN group default.
3. Users can modify/add/remove connection ports to/from VLAN groups.
4. Select group number first.
5. Select the port number to be added or removed.
6. Repeat Step 5 to complete the setup of one VLAN group.
7. Repeat Step 4~5 to complete the setup of another VLAN group.
8. Quit to the main menu.

Notes: Data will only be forwarded to ports in the same VLAN group. Data will not be forwarded to ports in different VLAN groups, just like they were not connected together. The factory default setting of the switch is all ports are in the same VLAN group.

[4] Setup Trunking Connection of the Switch

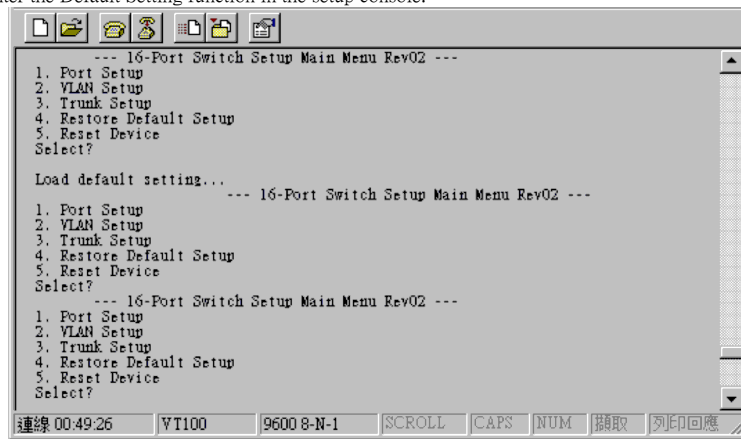
1. Enter the Trunking setup function in the setup console as follow.



2. The VLAN and Trunking functions of the Switch cannot work at the same Time. If Trunking function is enabled, the VLAN function will be disabled.
3. User may see current trunk connection configuration. Because there may be two trunk connections for the switch, please select one of them to setup.
4. Set how many ports used for the trunk connection.
5. After setup, user can quit and save the setting.
6. Then user may create the trunk connection-connecting crossover cables from the trunking ports of thw Switch to another switching hub. These ports on the other switching hub must be Trunking ports. Please refer to section on the other switching hub must be Trunking ports. Please refer to section 4.2 for creating trunk connection.

[5] Setup the Switch to Default Setting

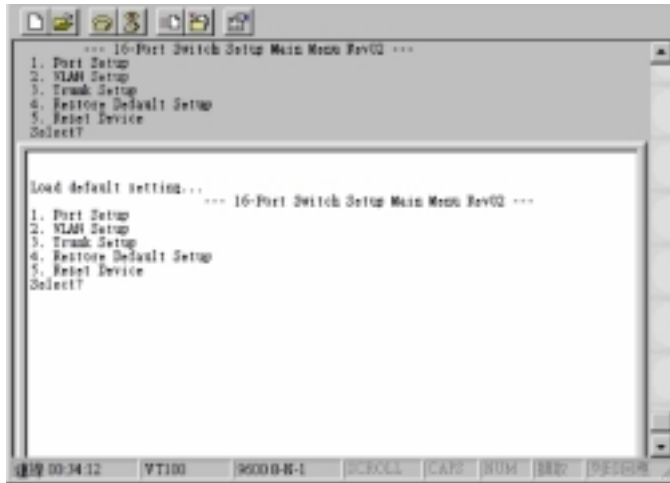
1. Enter the Default Setting function in the setup console.



2. Recover to default setting.

[6] Reset Device of the Switch

1. Enter the Reset Device setup function in the setup console.



3.2 Add Extension Ports with Module

There is module port on the rear panel of the Switch. User can add one more 100Base-FX SC/ST ports from it and the Switch will become a 17 ports Switch. (Please refer to Installation Guide at the first page of this user's manual.) User can add the module for their networking environment.

1. The module is fixed on the Switch with two screws.
2. Power off the Switch before adding the module.
3. Turn the screws counterclockwise with fingers or screw driver to loosen the module cover.
4. Remove the module cover when it is loosened.
5. Slide the new module into the module port.
6. Turn the screws clockwise with fingers or screw driver to fix the module on the switch.

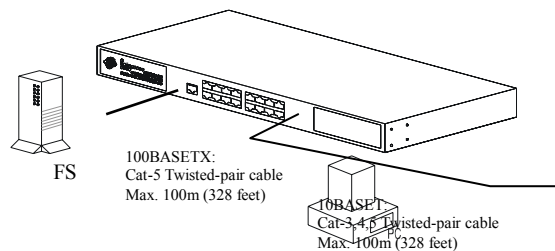
[Warning:] Before remove or plug the module on the Switch, please make sure the power is off. Otherwise, the module and Switch may be damaged.

4. Configure the Network Connection

4.1 Connecting Devices to the Switch

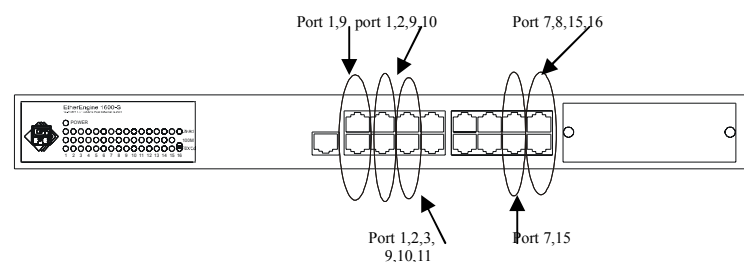
Connection Guidelines:

- Use Category 3 or 5 twisted-pair Ethernet cable when connecting 10BaseT devices to the hub (cable pin assignments defined in Appendix A)
- Use Category 5 (straight-through) twisted-pair Ethernet cable when connecting 100BaseTX devices to the hub (cable specifications are defined in Appendix B)
- Always limit the cable distance to 100 meters (328 ft) as defined by IEEE specification.
- If 100Base-FX connections the maximum cable length is 2Km (1.24miles).



4.2 Trunking to Another Ethernet Switch

1. Two trunking connections maximum is allowed for this switch. The first trunking connection can be built on Port(1,9), or Port(1,2,9,10), or Port(1,2,3,9,10,11). The other trunking connection can be built on Port(7,15), or Port(7,8,15,16), or Port(7,8,15,16, extension module ports). Please refer to following front panel about the trunking connection.

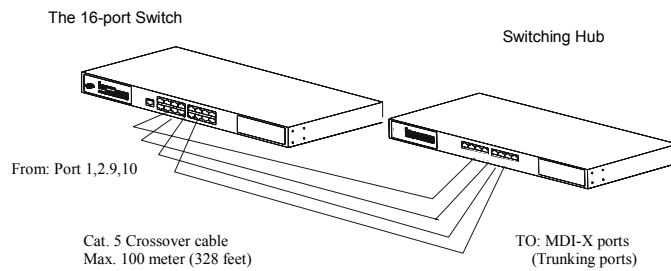


The total bandwidth is 400Mbps if two ports are used for trunking connection.

The total bandwidth is 800Mbps if four ports are used for trunking connection.

The total bandwidth is 1200Mbps if six ports are used for trunking connection.

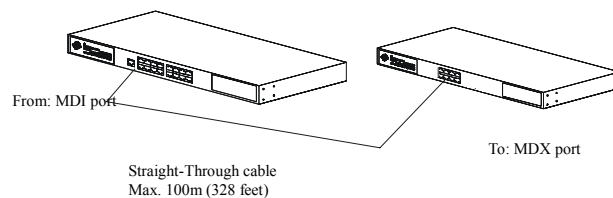
2. Connect from the trunking ports of the Switch to another Ethernet switch with Cat.5 crossover cables and the connection ports of the other switch must be trunking ports.
3. After making the connection, please refer to Section 3.1 to setup the trunking function of the switch



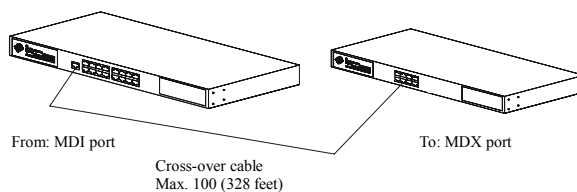
4.3 Connecting to Another Ethernet Switch/Hub (Non-Trunking)

The Switch can be connected to existing 10Mbps or 100Mbps hubs/switches. The switch/hub to switch/hub connection guidelines are as follows:

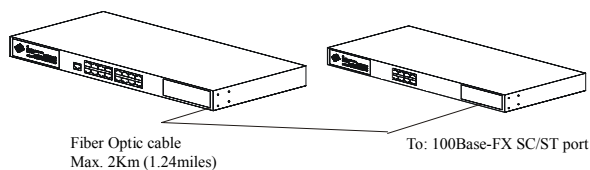
4.3.1 MDI to MDX Connect – Use normal “Straight Through” TP Cable when connecting the Switch MDI port to another standard port at the other hub.



4.3.2 MDX to MDX Connect – Use crossover TP cable when connecting the Switch device port to another standard port at the other hub.



4.3.3 100Base-FX to 100Base-FX Connect – If the 100Base-FX SC/ST extension module is added to the Switch, users can connect to the 100Base-FX SC/ST ports of another switch/hub/adaptor with fiber optic cables. The maximum cable length is 2Km (1.24miles)



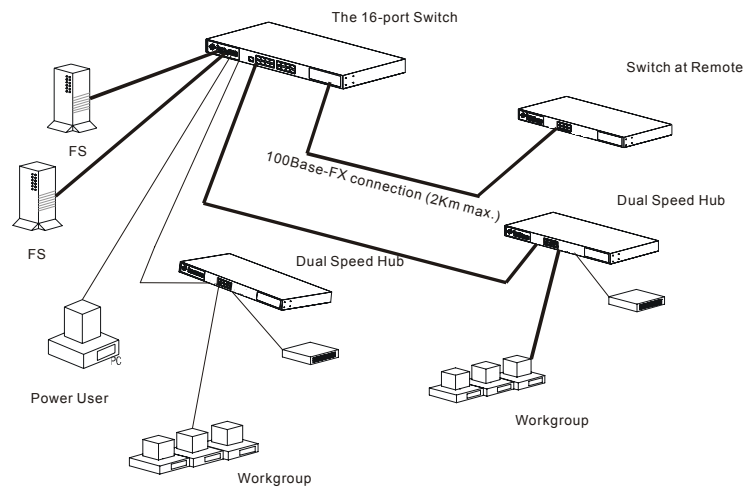
4.4 Application

An Ethernet switch can be used to overcome the hub to hub connectivity limitations as well as improve overall network performance. Switches make intelligent decisions about where to send network traffic based on the destination address of the packet. As a result, the switch can significantly reduce unnecessary traffic.

The example below demonstrates the switch ability to segment the network. The number of nodes on each segment is reduced thereby minimizing network contention (collisions) and boosting the available bandwidth per port.

User can setup VLAN of the 16-port Switch for network management. User can also setup Trunking of the 16-port Switch for faster trunk connection between switches.

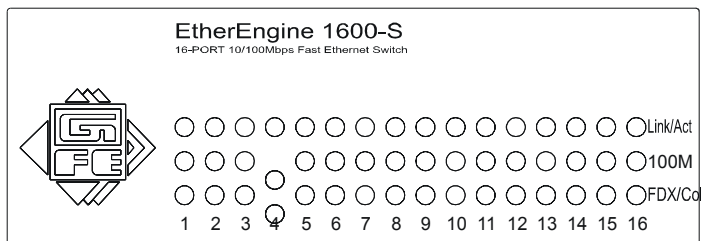
Please refer to Section 3.1 for the configuration of the 16-port Switch.



5. LEDs Defined

5.1 LEDs Defined

The 16-port Switch LEDs provide useful information about the hub and the status of all individual ports.



LED	STATUS	CONDITION
Power	ON	Hub is receiving power
Link / Act	ON	Port has established a valid link
	Flashing	Data packets being received or sent
100M	ON	The connection speed is 100Mbps
	OFF	The connection speed is 10Mbps
FDX / Col	ON	The connection is Full Duplex
	Flashing	Packet collisions occurring. A low level of collision is a part of normal Ethernet Operation

6. Troubleshooting

6.1 Resolving No Link Conditions

The possible causes for a no link LED status are as follow:

- The attached device is not powered on
- The cable may not be the correct type or is faulty
- The installed building premise cable is faulty
- The switch port may be faulty

Note: Because Port 16 MDI-X port and the MDI port share the same components, if the port 16 MDI-X port is used, please don't use the MDI port. Or, if the MDI port is used, please don't use the Port 16 MDI-X port.

6.2 Q&A

1. Computer A can connect to Computer B, but cannot connect to Computer C through the 16-port Switch.
 - Computer A and Computer C may be in different VLAN groups. Please check the VLAN setup from the Console port.
 - The network device of Computer C may fail to work. Please check the link/act status of Computer C on the LED indicator. Try another network device on this connection.
 - The network configuration of Computer C may be something wrong. Please verify the network configuration on Computer C.
2. The trunk connection function fails to work.
 - Please check the trunking cables are connected on trunking ports. (Please refer to Section 4.2 for trunking connection).
 - The connection ports on another switch must be trunking ports. Please check if trunking switching ports are used on that switch.
 - Because the connection ports on both sides are MDI-X ports, crossover cables are needed for the trunk connection. Please check the cables. Cat5 is suggested.
 - Please check the trunking setup from the Console port of the Switch to verify the trunking function is enable. (Notes: VLAN will be disable when trunking is enabled.)

3. The setup page of the Console port cannot appear.
- The COM port parameters are [Baud Rate: 9600, Data Bits: 8, Parity Bits: None, Stop Bit: 1, Flow Control: None]. Please check the COM port property in the Hypertrm program.
 - Check the RJ45-DB9 adapters are connected well on the Console port of the 16-port Switch and COM port of PC.
 - A straight-through TP cable is requested to connect the RJ45-DB9 adapters together. Please check if the correct cable is used.
 - Check if the COM of the PC is enabled.
4. How to configure the 16-port Switch in DOS?
- The “Hypertrm” is the terminal program in Win95/98/NT. Users can use any other terminal programs in DOS/Unix/OS2... to configure the Switch. The user interface is similar with Hypertrm. Please refer to the user guide of that terminal program. But the COM port parameters must be [Baud Rate: 9600, Data Bits: 8, Parity Bits: None, Stop Bit: 1, Flow Control: None].
 - PROCOMM and TELIX are DOS terminal program. Users can use these programs to configure the Switch.

A. Product Specifications

Access Method	CSMA/CD, 10Mbps or 100Mbps
Standards Conformance	IEEE 802.3 10BASE-T, IEEE 802.3u 100BASE-TX, (100Base-FX for the extension ports)
Communication Rate	10/100Mbps on RJ-45 ports, (100Mbps on SC/ST ports)
Communication Mode	Full/Half duplex
Media Supported	10BASE-T – 100 Ohm Category 3,4,5 twisted-pair 100BASE-TX – 100 Ohm Category 5 twisted-pair (100Base-FX – Fiber Optic cable)
Indicator Panel	LEDs for Power, Link/Act, Speed, FDX/Col.
Number of Ports	Sixteen 10BASE-T/100BASE-TX RJ45 ports, One Module port, One Console port
MDI-X/MDI Selection	Alternate Port
Dimensions	330mmx204mmx44mm (LxWxH)
Weight	1.7 Kg (3.74lb)
Certification	CE Mark
Emissions	FCC Class A / VCCI Class-1 / CISPR Class A
Immunity	IEC 1000-4-2/3/4
Power Consumption	22 Watts max.
Input Power	Full range: 100 to 240V, 50 to 60 Hz
Temperature	Standard Operating: 0 to 40°C (32 to 104°F) Storage: -40 to 70°C (-40 to 158°F)
Humidity	5% to 95% (Non-condensing)
Network Bridging Function	Filtering, forwarding and learning
Switching Method	Store-and-forward
Address Table	8K entries
Queue Buffer	512K Bytes Shared Buffer
Filtering/Forwarding Rate	Line speed
VLAN Function	Port-Base, 8 groups max., setup by Console
Trunking Function	Two trunk connections allowed, 6 port/trunk max. (1.2Gbps max.), setup by Console
Console Port	DB9 connector for RS-232 connection

B. Cable Specification

Three different types of cable are specified for use on the 16-port Switch:

- ◎ Standard “straight through” cable
- ◎ hub to Hub “cross-over” cable
- ◎ Fiber Optic cable (if the extension SC/ST module ports are added)

Cable Schematics

Standard Straight-Through Cable				
Hub / Switch side			Adapter side	
Pin#	Pair#		Pin#	Pair#
1. RX+	White-Orange	-----	1. RX+	White-Orange
2. RX-	Orange	-----	2. RX-	Orange
3. TX+	White-Green	-----	3. TX+	White-Green
4. Not Used	Blue	-----	4. Not Used	Blue
5. Not Used	White-Blue	-----	5. Not Used	White-Blue
6. TX-	Green	-----	6. TX-	Green
7. Not Used	White-Brown	-----	7. Not Used	White-Brown
8. Not Used	Brown	-----	8. Not Used	Brown
Hub-to-Hub Cross-Over Cable				
Hub / Switch side			Hub / Switch side	
Pin#	Pair#		Pin#	Pair#
1. RX+	White-Orange	-----	1. TX+	White-Green
2. RX-	Orange	-----	2. TX-	Green
3. TX+	White-Green	-----	3. RX+	White-Orange
4. Not Used	Blue	-----	4. Not Used	Blue
5. Not Used	White-Blue	-----	5. Not Used	White-Blue
6. TX-	Green	-----	6. RX-	Orange
7. Not Used	White-Brown	-----	7. Not Used	White-Brown
8. Not Used	Brown	-----	8. Not Used	Brown

Cable Type and Use

Connection	Speed	Cable Type
Hub to Hub (or Switch)	10Mbps	Cross-over, Cat-3,4,5 twisted pair
Hub to Hub (or Switch)	100Mbps	Cross-over, Cat-5 twisted pair
Hub to Server or Workstation	10Mbps	Straight-Through, Cat-3,4,5 Twisted pair
Hub to Server or Workstation	100Mbps	Straight-Through, Cat-5 Twisted pair
Hub to Print Sever	10Mbps	Straight-Through, Cat-3,4,5 Twisted pair
Hub to Print Sever	100Mbps	Straight-Through, Cat-5 Twisted pair

C. Compliances

EMI Certification

FCC Class A Certification (USA)

Warning: This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A digital device pursuant to Subpart B of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures are required to correct the interference.

Canada Department of Communications – Class A

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus as set out in the interference-causing equipment standard entitled “Digital Apparatus”, ICES-003 of the Department of Communications.

VCCI Class-I Compliance (Japan)

この装置は、情報技術装置等電波障害自主規制協議会（V C C I）の基準に基づいたクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Warning! Do not plug a phone jack connector in the RJ-45 port. This may damage this device.

D. Warranty

We warrant to the original owner that the product delivered in this package will be free from defects in material and workmanship for a period of warranty time from the date of purchase from us or the authorized reseller. The warranty does not cover the product if it is damaged in the process of being installed. We recommend that you have the company from whom you purchased this product install it.